ALPEN-ADRIA UNIVERSITÄT KLAGENFURT

# INVITATION TO THE DOCTORAL SEMINAR

**Postdoc-Ass. Dr. Viktoriia Grushkovska**
Universität Klagenfurt

**"Extremum seeking algorithms for nonlinear systems: control design and stability properties (Vorstellung Habilitationsvorhaben)"**

classroom.aau.at/math-stat

Wednesday, 14 April 2021

10:00 a.m.

## Abstract

In many applied problems, it is necessary to stabilize a system at some optimal operating point which is a priori unknown. One of the powerful tools to tackle such problems is extremum seeking theory, which allows to minimize (or maximize) the output of the system using only some limited information. This talk presents a novel approach for generating model-free extremum seeking controllers based on Lie bracket approximation techniques. The proposed algorithms exploit time-periodic control inputs with output-dependent coefficients. Conditions for the practical asymptotic stability and asymptotic stability in the sense of Lyapunov are proposed depending on the properties of the system and control vector fields. The obtained results are illustrated by numerical simulations and experiments with a mobile robot.

Christian Pötzsche and the Department of Mathematics look forward to seeing you at the talk!